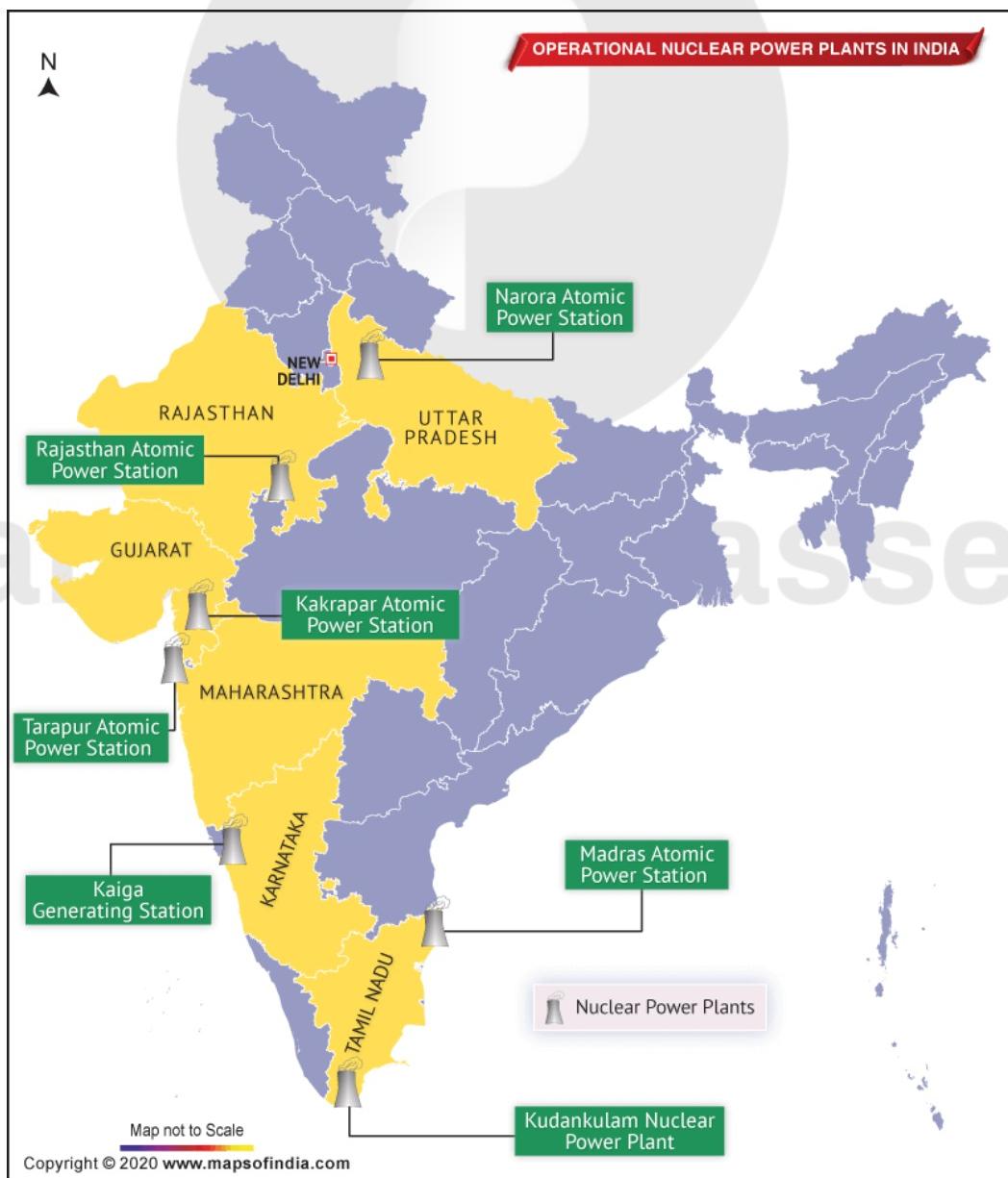


# ATOMIC & NUCLEAR POWER PLANTS IN INDIA



# Introduction to Nuclear Energy

- **Nuclear Power** - Power produced by Nuclear Reactions
- Nuclear power is an efficient way of boiling water to create steam, this steam is used to turn turbines, which creates electricity.
- Nuclear energy has smaller land footprint and the amount of waste it produces.
- Nuclear Reactions releases huge energy - **fission and fusion**
  - **Fission** is the splitting of a heavy, unstable nucleus into two lighter nuclei, and
  - **Fusion** - two light nuclei combine together (Sun, Atoms bombs)
- Three most relevant fissile isotopes are **uranium-233, uranium-235 and plutonium-239**.
- The architect of the Indian Atomic Energy programme, and the father of nuclear research in India : **Homi Jehangir Bhabha**

## Few Facts

- **APSARA:** The first experimental nuclear reactor (Research Reactor)
  - At Trombay campus of Bhabha Atomic Research Centre
  - was indigenously built and commissioned in 1956.
  - With APSARA, India became the first Asian country outside the erstwhile Soviet Union, to have designed and built its own nuclear reactor.
- **KAMINI:** the first reactor in the world operating with 233U fuel.
  - KAMINI (Kalpakkam Mini reactor) is at **Indira Gandhi Center for Atomic Research in Kalpakkam**
- The first nuclear power project was commenced at **Tarapur, Maharashtra**, 1969.
- The first PHWR project is located at **Rawatbhata, Rajasthan**.
  - The reactors are located on bank of Rana Pratap Sagar Lake on Chambal River.
  - Pressurized heavy-water reactor (**PHWR**) is a nuclear reactor that uses heavy water (deuterium oxide D<sub>2</sub>O) as its coolant and neutron moderator
- highest-capacity nuclear plant in India: **Kudankulam Nuclear Power**

# NUCLEAR POWER CORPORATION OF INDIA LIMITED (NPCIL)

- fully owned company of the Government of India, Department of Atomic Energy
- Started functioning from 17th September 1987.
- It is responsible for the generation of nuclear power for electricity.
- **Location :** Mumbai, Maharashtra
- **Chairman & Managing Director :**

Shri Mukesh Singhal (in-charge)



## **NUCLEAR POWER IN INDIA**

- Nuclear power is the fifth-largest source of electricity in India after coal, gas, hydroelectricity and wind power.
- India has 22 nuclear reactors in operation in 7 nuclear power plants.



### Narora Atomic Power Station (NAPS)

**Location :** Narora, Uttar Pradesh

### Kakrapar Atomic Power Station (KAPS)

**Location :** Gujarat

(proximity of Surat and Tapi river)

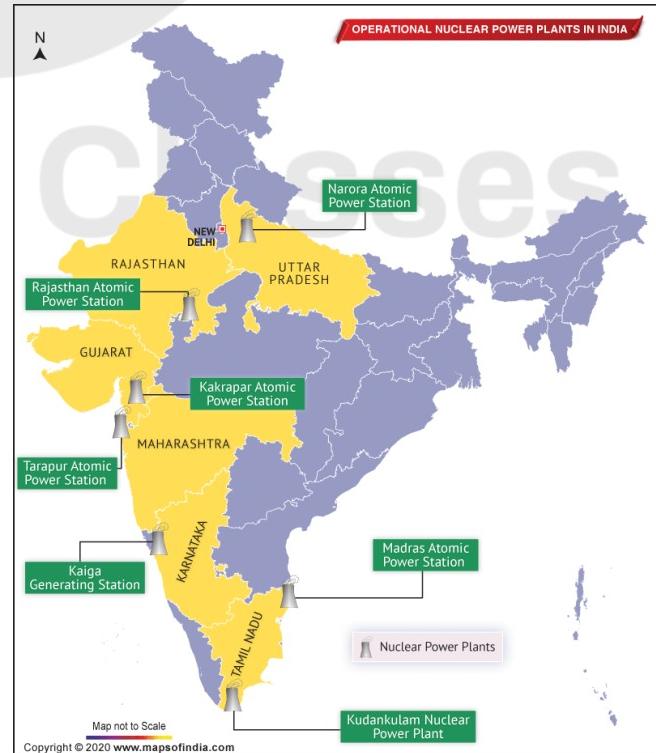
### Rajasthan Atomic Power Station (RAPS)

**Location :** Rawatbhata, Rajasthan

(Rana Pratap Sagar Dam, Chambal River)

### Tarapur Atomic Power Station (TAPS)

**Location :** Tarapur, Maharashtra



Kaiga Generating Station (KGS)

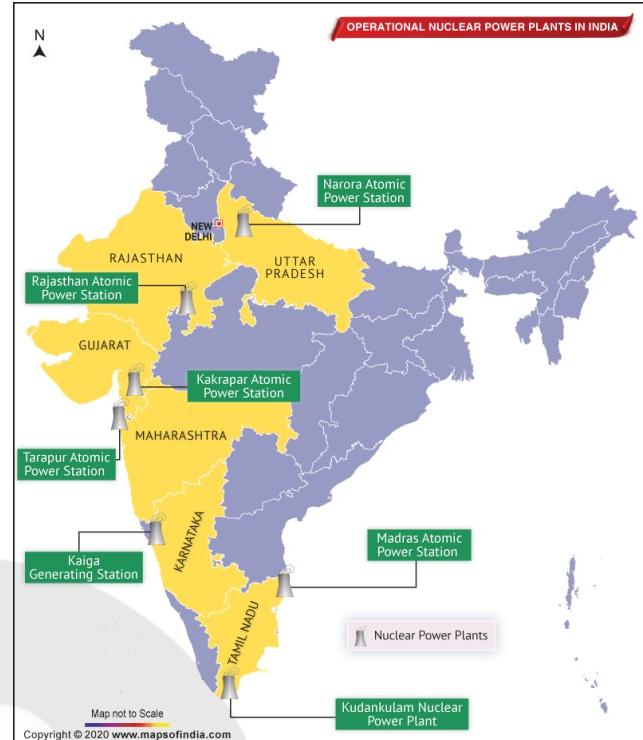
**Location :** Kaiga, Karnataka  
(Proximity of Kali River)

Madras Atomic Power Station (MAPS)

**Location :** Kalpakkam, Chennai, Tamil Nadu

Kudankulam Nuclear Power Station (KKNPS)

**Location :** Tirunelveli, TN



## Nuclear Power Plants in India - Under Construction

Power Plant	Location
Madras (Kalpakkam)	Tamil Nadu
Kakrapar Unit 4	Gujarat
<b>Gorakhpur</b>	<b>Haryana</b>
Rajasthan Unit 7 & 8	Rajasthan
Kudankulam Unit 3 & 4	Tamil Nadu

nine nuclear reactors by 2024 and a new nuclear project, the first in northern India

## Nuclear Power Plants in India - Planned Projects

Power Plant	Location
Kaiga	Karnataka
Jaitapur	Maharashtra
Kovvada	Andhra Pradesh
Kavali	Andhra Pradesh
Gorakhpur	Haryana
Mahi Banswara	Rajasthan
Chutka	Madhya Pradesh
Kudankulam Unit 5 & 6	Tamil Nadu
Madras	Tamil Nadu
Tarapur	Maharashtra